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section and the outer surface area of the first segment into engagement with the cavity of said socket when said stud is in the extended position to prevent rotation of said ball in said socket, said inner edge of said bracket engaging said ball when said stud is in the extended position to prevent rotation of said ball in said cavity.

Please cancel claim 75 without prejudice and without admitting anticipation.

Favorable reconsideration of the application is respectfully requested.

### REMARKS

Claims 2-29 and 31-74 and 76-96 are pending in this application. Claim 75 has been canceled pursuant to this Amendment. The Examiner has indicated that Claims 42-68, 76, 84-91 and 95-95 are allowed. As set forth below, Applicants submit that claims 2-24, 26-29 and 31-74 and 76-96 are directed to patentable subject matter, and are believed to be in condition for allowance. Issuance of a Notice of Allowability is respectfully requested.

Claims 2-29, 31-41 70-73 and 78-82 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. Applicants have made changes to the claims to overcome the examples of indefinite language as noted by the Examiner. More specifically, the Examiner noted that pending claims 6, 18, 21, and 22 allegedly include instances of vagueness with respect to whether a combination of a backrest and a chair or a subcombination of a backrest system for a chair is claimed. Applicants also noted language similar to that objected to by the Examiner in claim 26, line 4; claim 40, line 4; claim 69, lines 4 and 9; and claim 92, line 10. Accordingly, Applicants have amended each of claims 2, 6, 18, 21, 22, 26, 40, 69 and 92 to clarify that a subcombination of a backrest system for a chair is claimed. For example, the Examiner notes that line 9 of pending claim 1 appears to set forth a combination in the requirement that "one side

plate being disposed between each post” of the chair. To avoid any confusion, this limitation, which now appears in amended claim 2 at lines 13-14, requires that the side plate is adapted to be disposed between each post. Similar corrections are made throughout the above-noted amended claims.

Claim 39 is amended to provide reference to the “individual” as set forth in claim 18 from which it depends, and avoid the lack of antecedent basis associated with the term “user”.

The Examiner also stated that the phrase “movable inwardly and outwardly” as set forth in claim 78 lacks sufficient structure or means to support the functional language. Similar language also appears in claim 74 at lines 6-7. Each of these claims is amended to avoid any indefiniteness and provide sufficient structural support by requiring that the first section of the ball is movable inwardly toward and outwardly away from the second section of the ball.

In view of these amendments to the claims, Applicants believe the requirements of 35 U.S.C. § 112, second paragraph, are satisfied for claims 2-29, 31-41 70-73 and 78-82. Since the Examiner found claims 2-29, 31-41 70-73 and 78-82 to be allowable over the prior art if rewritten to overcome §112, second paragraph, rejections, Applicants believe claims 2-29, 31-41 70-73 and 78-82 also are in condition for allowance.

Turning now to the Examiner’s rejections based on 35 U.S.C. § 102(b), Claims 69 and 92 as amended are believed to distinguish over Jay et al. (5,593,211). Jay ‘211 discloses a back system including a rigid shell back 36 and four separate post engaging assemblies 50 (i.e., an upper pair and a lower pair) coupled to the shell back 36 to permanently attach the shell back 36 to the wheelchair frame posts 52. In rejecting claims 69 and 92, the Examiner noted that the claimed attachment assemblies appeared to set forth two points of attachment at each post, resulting in four points of attachment.

Claims 69 and 92 are amended pursuant to this Amendment to clarify that the two point attachment assembly has one point of attachment on each post, resulting in two points of attachment.

Clearly, the four-point mounting of the back system in the '211 patent differs significantly from the two-point attachment assembly set forth in amended claims 18, 69 and 92. The two-point assembly allows the back support and support chassis to be easily removed from the posts. Conventional four-point attachment schemes are more difficult to operate. Nothing in the '211 patent teaches or suggests employing a two-point attachment assembly. To the contrary, the '211 patent actually teaches away from the present invention by stating that a four point mounting means is necessary to attach the back system to the posts. Moreover, the mounting means 50 of the '211 patent includes post brackets 56 and twist retainers 70 that are permanently affixed to the wheelchair posts. In contrast, the attachment assembly of the present invention is connectable to the posts and is not permanently affixed thereto. Thus, the '211 patent fails to teach or suggest the improved attachment assembly of the present invention that can be easily positioned along the posts at infinite locations along the posts as the person's condition or dimensions (height or width) change, or if the backrest no longer properly supports the user. Furthermore, the '211 patent does not teach the structure as set forth in claim 92 of a chassis that supports a back support at a desired incline with respect to the posts. Accordingly, amended claims 69 and 92 are believed to be allowable, and withdrawal of this rejection is respectfully requested.

Claims 70-73 depend from and further define claim 69. Accordingly, these dependent claims are believed to be allowable for the reasons set forth above with respect to claim 69.

Claims 74, 83 and 96 as amended are believed to be patentable over Newkirk, U.S. Patent No. 2,928,686. Newkirk discloses a universal ball and socket having a socket 10 attached to a fixed base, and a ball 12 disposed in the socket. A vise base 20 is attached to the ball so that the vise base 20 can be moved into a desired adjusted position upon rotation of the ball in the socket. The ball is tightly secured in the socket by an activating screw 28 to force a sliding plug 30 of the ball into close contact with the socket 14, thus forcing the ball 12 into tight contact with the circular opening 24 of the collar 22. The plug 30 is at least partially disposed in a hollowed out portion of the ball at all times.

With respect to claims 74 and 83, the Examiner states that "contrary to Applicant's arguments, the plug in Newkirk is clearly formed by passing a cutting plane through the ball so that the first section has a maximum circumference corresponding to that of a small circle of the ball, and the second section has a maximum circumference corresponding to that of a great circle of the ball." Applicants disagree with Examiner's analysis and believes that Figures 1 and 2 of Newkirk clearly support Applicant's arguments. More specifically, Figures 1 and 2 show that the cylindrical plug 30 of Newkirk is adapted to be received in a hollowed out portion of the ball (see also, column 2, lines 9-11). Such a plug having a cylindrical shape cannot be formed by passing a cutting plane through the ball. It is not possible to obtain the cylindrical side walls of the plug using a cutting plane. Moreover, it is not possible to obtain the hollowed out portion of the ball using a cutting plane. Instead, the hollowed out portion of the ball could be

formed using a drill or a boring instrument to form the necessary channel in which the plug is received. In fact, passing a cutting plane through the ball would actually destroy the hollowed out section of the ball if such a cutting plane intersects the hollowed out portion.

Such a configuration as taught by Newkirk clearly differs from the claimed invention. To further define the sections of the ball, claims 74, 83 and 96 are amended to provide that the first and second sections or segments of the spherical ball have outer surface areas or zones terminating in juxtaposed planar base surfaces defined by the cutting plane. The planar base surfaces have diameters corresponding to the diameter of the small circle of the ball. Such segments or sections of a sphere clearly are not taught or suggested by the cylindrical plug and bored out hole of the Newkirk patent.

The Newkirk invention also teaches away from the present invention by teaching that it is necessary to provide a plug that is securely disposed at least partially within the hollowed out opening of the ball at all times to prevent rotation of the ball in the socket. The present invention provides that the first section is moved inwardly toward and outwardly away from the second section, without being housed within an opening in the second section. More specifically, claims 74, 83 and 96 provide the planar base surface of the first section or segment is moved outwardly away and spaced from the planar base surface of the second section or segment. Clearly, such spaced apart segments are not taught or suggested by Newkirk.

Furthermore, the edge of the plug in Newkirk will abrade and resist movement of the ball in the socket. The plug edge exerts an approximately normal force on the socket surface that produces a maximum edge effect to prevent movement of the ball in the

socket. In contrast, the edge of the first section of the ball in the present invention does not abrade or resist movement of the ball in a similar manner as required in Newkirk. The amount of load transmitted to the socket at the edge of the first section is significantly less than the Newkirk ball and socket bind. The reduced loading results from the angle formed between the load applied from the screw and the component force (normal) to the inner surface of the socket. Moreover, the spherical outer surface area or zone of the first section or segment provides a larger contact area with the socket for locking the ball when compared to the Newkirk sliding plug. Thus, the claimed invention is distinguishable over Newkirk for these reasons as well as those set forth above.

The claimed invention also requires that when the ball is in the unlocked position, the socket rotates with respect to the ball, and movement of the socket is prevented when the ball is in the locked position. This is in sharp contrast to the teachings of the Newkirk patent which require the socket to be maintained in a fixed location and the ball to rotate with respect to the socket. The teachings of Newkirk comport with those of conventional ball and socket joints in which the ball rotates in the socket, as opposed to the socket rotating about the ball, as required in the present invention. The Examiner appears to suggest that there is no distinction between a ball that rotates relative to a socket and a socket that rotates relative to a ball. However, Applicants dispute this contention and believe that it is advantageous in certain applications to provide a ball and socket joint in which the ball has a fixed position and the socket is moveable relative to the ball. For example, the ball and socket joint as used in the backrest system of the present invention allows for unique and precise positioning of the back support pads because the socket is permitted to rotate about the ball while the ball remains in a fixed position. Providing a

socket having a fixed location and a ball that rotates relative to the socket in this application would not yield the same results. Thus, Applicants believe claims 74, 83 and 96 are allowable for these reasons as well.

Based upon the foregoing, Applicants believe that claims 74, 83 and 96 as amended, are allowable over Newkirk. Withdrawal of these rejections is respectfully requested.

Claim 77 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over the '686 patent to Newkirk in view of U.S. Patent No. 4,565,345 issued to Templemann. Claim 77 depends from and further defines claim 74, as amended, and is believed to be allowable for the reasons set forth above with respect to claim 74. Claim 77 further provides for the first section to be constructed from a nylon material, with the nylon material allowing for flexure of the first section in the socket when in the locked position to prevent movement of the ball in the socket when an external load is applied to the socket. Neither Newkirk nor Templemann teaches the use of nylon material for the first section of the ball. Thus, the claimed ball and socket joint is not taught or suggested by Templemann taken alone or in combination with Newkirk.

Templemann discloses a mirror assembly having an expandable ball and socket arrangement for retaining the mirror in a desired position. The expandable ball has a plurality of laterally spaced partially spherical segments that have slots or relief grooves formed therebetween. When a draw bolt is drawn through the ball member, the ball segments expand against the socket to prevent rotation of the mirror housing. In this configuration, the ball member is fabricated from a material such as 30% glass filled nylon. However, this arrangement would not adequately lock the ball in the socket when

subjected to external loads such as, for example, loads applied to pads on a wheelchair. The segments of the ball would tend to flex too much to maintain the necessary contact force against the socket to prevent movement of the socket when subjected to external loads. Accordingly, the glass filled nylon segmented ball of the Templemann patent does not teach or suggest the present invention, as set forth in the claim 77 wherein neither the first section nor the second section is segmented.

Moreover, any hypothetical combination of Templemann and Newkirk does not teach the present invention, as set forth in amended claim 77. Replacing the plug of Newkirk with the expandable ball of Templemann does not teach or suggest the present invention for the reasons set forth above. The Examiner asserts that it would have been obvious to modify Newkirk in view of Templemann by configuring the plug from a nylon material. However, there is no teaching, suggestion or motivation in Templemann or Newkirk to combine the references as suggested by the Examiner. Instead, it appears that the Examiner has impermissibly used the Applicants' teachings to hunt through the prior art for the claimed elements and attempt to combine them as claimed. In re Vaeck, 947 F.2d 488 (Fed. Cir. 1991); In re Bond, 910 F.2d 831 (Fed. Cir. 1990), In re Laskowski, 871 F.2d 115, 117 (Fed. Cir. 1989).

Moreover, neither patent presents addresses the problem associated with preventing rotation of the socket about the ball when an external load is applied to the socket. Constructing the first section of the present invention from a nylon material allows for significant loads to be applied to the socket without displacing the socket with respect to the ball. Also, providing a slick outer surface for the first section when constructed from nylon allows for smooth movement of the ball in the socket when the



ball is in the unlocked position. Such a solution as set forth in the claims to overcome problems associated with conventional ball and socket configurations is not taught or suggested by these references taken alone or in combination. Thus, allowance of claim 77 is respectfully requested for these reasons as well as those set forth above with respect to claim 74.

In view of the foregoing, Applicants believe that claims 2-29, 31-41, 69-74, 77-83, 92 and 96, as amended, overcome the Examiner's rejections and place this application in condition for allowance. Therefore, Applicant respectfully requests issuance of a Notice of Allowability with respect to claims 2-29 and 31-74 and 76-96.

Respectfully submitted,



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